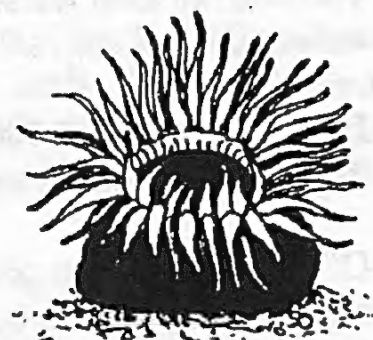


*The*

May 2004

# *Ballarat Naturalist*



Red sea anemone

## **Beneath the Waves—the Marine Life of Port Phillip Bay**

**Speaker: Dr. Jan Watson**

Dr. Jan Watson is one of the earliest SCUBA divers to explore local Victorian waters, her work changing the emphasis on bay studies from geology to marine ecology. After qualifying in Metallurgical Chemistry at SMB and in Geology at RMIT, she changed direction and specialised in marine hydroids. In the early 1970s she founded and managed Marine Science and Ecology Pty Ltd, a marine environmental consultancy working on assessment of marine development, pollution and monitoring of discharges to sea.

Pinning an Admiralty chart of the bay up on the wall, Jan gave us an outline of its geography and geology. The bay covers 2000 km<sup>2</sup> and is 22m deep at its deepest point. The periphery is sandy around the southern and eastern shores, becoming muddy and silty towards Geelong and the Bellarine Peninsula. The centre is also muddy. A basalt reef outcrops in the NW part of the bay, while the ocean coast and the entrance to the bay feature calcarenite.

Ten thousand years ago the bay was dry land. The ancestral Yarra flowed into Bass Strait near King Island. The channels through the shallow areas near the mouth of the bay are remnants of these old rivers. What we now call The Rip is a gorge 90m deep. At the head of the bay the marine environment is quiet but nearer the mouth the currents can reach 8-10 knots; a diver working here has only 20 minutes of slack water to work in. The northern part of the bay tends to be cloudy due to sediments carried in by the Yarra when it's in flood—but that hasn't happened for several years!

Four major studies of the bay have been carried out over the years:

1. In the 1850s many organisms were collected near the mouth and passed on to expert naturalists and to the museum.

2. 1957-63: divers from the National Museum of Victoria surveyed the entire area.
3. 1968-71: the Department of Fisheries and Wildlife made the first attempt to look at the ecology.
4. 1996 CSIRO undertook a study with the help of a \$40 levy each year for 2 years on the local rates! The ecology and the processes occurring in the bay were studied at different scales.

By 1990 more than 7000 species had been recorded and there will be more to come. The mouth of the bay contains the greatest biodiversity.

Of course there are pressures on the bay. Urbanisation surrounds it. In recent years sewage outfalls have been closed, and scallop fishing was halted 10 years ago. There is heavy fishing pressure, both recreational and commercial. Sewage from the Werribee Treatment Plant once injected 7000 tons of nitrogen into the water but that has been reduced to 5000 and will continue to decline towards 3000. However such discharge does provide food for polychaete worms, eaten by molluscs which are eaten by birds! Pope's Eye has been a reserve for 20 years, and there are others along the coast which are especially relevant to divers.

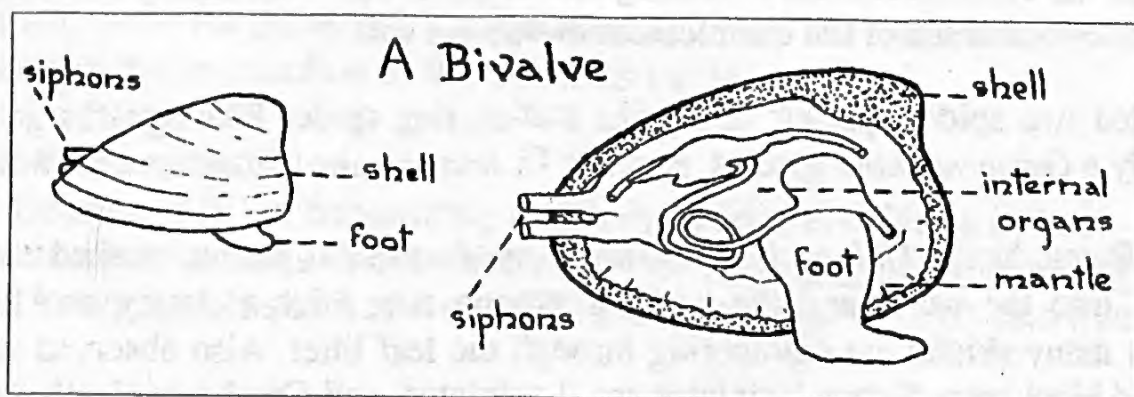
What would you see on a dive? Leaving aside the mammals and fish, there are:

- **Seagrasses**, especially in the Geelong area. *Heterozostera* provides a nursery environment for young fish, and *Amphibolis*, found predominantly in the south, flowers underwater!
- **Algae** i.e. seaweeds .
  - brown** (kelp) found in deeper rougher water and need less light.
  - red** is very common in the zones to 40m deep
  - green** is found in the shallow zones with more light which is needed for photosynthesis.
- **Invertebrates**—including those fixed to the bottom (sessile).
  - sponges**: a vast number of species.
  - bryozoa**: microscopic colonial creatures.
  - ascidians**: can secrete vanadium from seawater.
  - cnidaria** (formerly coelenterates) stinging cell creatures e.g. seapens, jellyfish, anemones.
  - arthropods**: jointed leg animals.
  - echinoderms**: spiny animals e.g. sea urchins, starfish, most with 5-fold symmetry.
  - polychaeta**: worms and others, often buried; can reach densities of 25,000/m<sup>2</sup> along the coast in calm conditions and soft sediments.
  - molluscs**: shelled animals.

Jan described all these categories with diagrams on the board to show their structure

mode of feeding. Then came a colourful array of slides as she showed us examples of each group and of the various substrates to be found around the bay. Species included the introduced starfish which recently arrived in Tasmania in ballast water from Japan and has since arrived here.

We saw red fern-like or "coralline" seaweed which can precipitate  $\text{CaCO}_3$ ; there were sponges of all sizes and colours; bryozoans with hundreds of tiny individual polyps hung in fronds. Tentacles protruded from the polychaete worms. Amongst the molluscs snails (gastropods), scallops (bivalves) and nudibranchs, brightly coloured to warn off predators, appeared before us.



Upon being asked whether the bay's ecology was fragile, Jan explained that it was pretty robust and that dredged areas and dumped spoil rapidly recolonise. The Rip bank has been blasted on and off for over 100 years; the Nepean bank is 13m below Low Water Spring Tide and in order to permit fully laden ships to pass, 2-3m would need to be removed. The main shipping channel is loose sand and is kept dredged.

It may intrigue you to know that Jan arrived for her talk on a motorbike, and returned to Melbourne immediately afterwards! Her current interests include studying collections of hydroids from the Mawson Antarctic Expedition, from the Recherche Archipelago W.A. and preparation of a field guide to the ecology of Pope's Eye.

## **Excursion: Jubilee Mine Historical Area**

**Leader: Fran Hanrahan**

Twelve members in total turned off the Glenelg Highway at Smythesdale and headed to Jubilee Mine Historical Area deep in the forest about the tributaries of the Woody Yaloak Creek. At the Historical Area, developed to cater for sightseers, the melodious White-eared Honeyeater welcomed us into its haunts which included a colony of the Australian native Coarse Dodder-laurel *Cassytha melantha*, a hemiparasitic species, this time of Blackwoods and eucalypts. Tiny suction pads of the Dodder-laurel vine were visible on close inspection.



At its peak the Jubilee Mine, opened in 1887, employed three hundred. What a transitory enterprise gold mining can be—little remains except brick abutments used to hold aloft long gone water tanks, and also a huge mullock heap dominated the scene. The screed tells us 8250 ounces of gold were extracted (four times the gold content of the Welcome Nugget, found at Bakery Hill 1858 and a replica of which is displayed on the Gold Monument in Sturt Street).

Brick furnace and boiler stand sentinel now—relics of the age of steam. How wonderful are the recuperative powers of Nature! Well, mostly, it appears, as there is plenty of the introduced spiny rush *Juncus acuta* around the old cyanide tanks installed at the commencement of mining and in the 1930s—our theory is the rush likes or tolerates best some of the chemicals spilt into the soil.

We noted two spider species: firstly the leaf-curling spider *Phonognatha graeffi* and secondly a *Gasteracantha* species, possibly *G. minax*—the Christmas or Jewel Spider.

Milky Beautyheads *Calocephalus lacteus*, an Australian native, pushed their little flowers into the world and the warm afternoon sun, after a cloudy cool morning, brought many skinks out scampering through the leaf litter. Also observed where introduced blackberry *Rubus laciniatus* ssp. *laciniatus*, and Cranberry Heath *Astralaria humifusum* in flower. Bird species noted were Yellow-throated Honeyeater, White-throated Treecreeper, Grey Fantail, a female Golden Whistler and two Crimson Rosellas.

After completing the sightseers' circuit of the mine site we translocated to the Jubilee dam site for lunch. Two female Superb Fairy Wrens flitted in the undergrowth. The Jubilee Dam is about 100 m across and the water body extends 130m upstream. We walked around the dam among the Scentbark *E. aromaphloia* ssp. *aromaphloia* and Swamp Gum *E. ovata* var. *ovata* eucalypts with their fragrant smelling (when rubbed) bark fibres and characteristic wavy leaves respectively.

A Kookaburra called Freshwater mussel shells were observed in the mud at water's edge. A well developed fungus, probably a White Punk *Laetiporus portentosus* although it had become discoloured, was seen on the trunk of a Swamp Gum about 2m above ground level. A large pupal case of a moth was noted near its host tree—an acacia species.

As we had a cup of tea at mid-afternoon I brought out an Audubon birch-wood bird-caller (given me by youngest sister at Christmas) and full of expectation filled the air with its pleasant notes for several minutes. No result—or was I too impatient? Fifteen minutes later we prepared to depart the scene—wonder of wonders—a male Scarlet Robin, a male Superb Fairy Wren and a male Grey Fantail, all inquisitive at the presence of these imposters, appeared!

Tony Johns

## April Meeting Points

- The President, Peter Dalman, welcomed 23 members and visitors.
- Public Liability Insurance arranged with Royal Horticultural Society of Victoria. (Affiliation \$20, Premium \$62 to 30 October 2004)
- That a vote of thanks to Trish and John Hughes for the work they did in preparing a list of the books in the library be recorded in the minutes.
- Lists of library books available from Fran Hanrahan. Members asked to rate the books as first step in sorting out the overcrowded library cupboard.
- Members were asked to put names on supper roster.
- Syllabus cards for 2004-2005 are available. Carol Hall was thanked for organising the production of the syllabus cards.

## Show and Tell.

- Peter Dalman: ABC is conducting a survey of flora and fauna in backyards around Australia. More information on [www.abc.net.au/wildwatch](http://www.abc.net.au/wildwatch). Gould League web site has webcams set up on nest of birds and possums.

## Field Reports

- John Mildren: At Mt Helen, 4 families of White-winged Choughs make a din while all competing to feed in the same area. Long-billed Corellas in Gear Avenue area.
- Helen Burgess: Seven Turtle Doves sitting on lawn in Ballarat North.
- Fran Hanrahan: Dead Wallaby in Victoria Park.
- Carol Hall: Six Great Egrets in central reed bed of Lake Wendouree.
- Les Hanrahan: On dam at Bungaree, 2 Great Egrets, Darter and White-necked Heron.
- Claire Dalman: Three whales, many dolphin and a few albatross seen during daylight crossing of Bass Strait.
- Greg Binns: Pair of Crimson Rosellas feeding on walnuts in central Ballarat garden. Large flock of Long-billed Corellas flying about at night.
- John Gregurke: Very little water in Lake Burrumbeet but up to 500 Pelicans present. Flock of Red-necked Stint, Red-capped Plover and Double-banded Plover on mud. Ducks and Avocet have left.
- Kevin Andrews: 300 Musk Duck at Lake Bolac.



## Lake Burrumbeet

"Lake Burrumbeet went dry on 20<sup>th</sup> March 2004 with the drying up of all visible water across the bed of the lake." These are the opening words of Fon Ryan's report to the recent meeting of the Lake Burrumbeet Advisory Committee.

Fon has kept a record of the water levels since 1996 and has prepared an accurate map of the water depths (see opposite). There are no deep pools or channels in the lake. The lake is a very shallow saucer shape with a maximum depth of 2.5 metres. When full, at least 80% of the lake bed is covered with over 2 metres of water.

At present Burrumbeet Creek is delivering 2 megalitres (ML) per day, which is spreading over about 50 hectares. This flow comes from Ballarat's northern sewage treatment plant. Waders such as Red-necked Stint, Red-capped Plover and Double-banded Plover are feeding on the muddy edges around the edge of this water. The total area of the lake is approximately 2000 hectares.

The average annual discharge of Burrumbeet Creek is 10,500 ML and this accounts for about 60% of the inflow into the lake. (Precipitation adds 30% and the remainder comes from several small creeks). The annual outflow from the sewage treatment plant is 2200 ML. If there were no flow from the sewage works the boating ban, imposed in 1997 due to low water levels, would have been necessary only one month earlier and the lake would probably have dried out in 2003.

When did the lake last go dry? The Environment Protection Authority report prepared after eutrophication of the lake in the early 1970s states that the lake dried in 1938, 1929, 1914 and 1839. Local landholders say that the 1938 date is incorrect. Further investigation is necessary to clarify the matter.

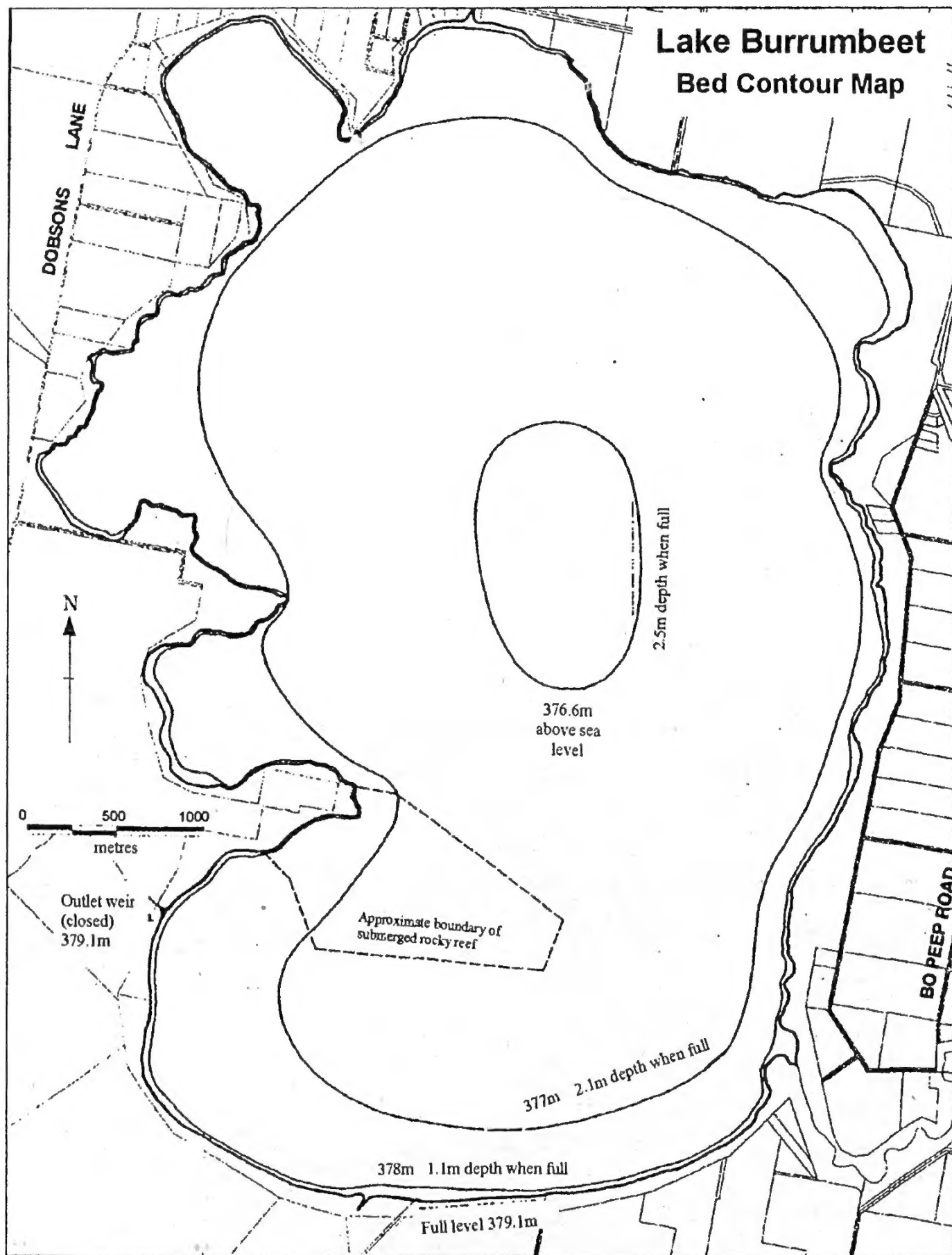
Works in progress or to be commenced soon include removal of pines near the Burrumbeet Caravan Park, spraying gorse along the eastern shore, fencing the foreshore north of Burrumbeet Creek inlet, construction of car park at Russell Reserve, fencing off red gums to allow regeneration on the south-west corner of the lake and burial of tyres along the western beach.

John Gregurke.

Black-winged  
Stilts often seen  
at the Lake as  
the water  
receded.







Map reproduced with permission from Fon Ryan.  
Some adjustments have been made for clarity.

# Calendar

## May

- Fri. 7 Meeting: Helen Burgess - *From Ecuador to Iguaçu.*  
Sat. 8 Excursion: *Macedon Ranges*—Leader John Gregurke.  
Tues. 25 Committee Meeting @ Dalman's, 7.30pm

## June

- Fri. 4 Meeting: Members' Presentations—Namibia/Weeds/ UK Bird Reserves.  
Sun. 6 Excursion: *Fungi* with Les Hanrahan.

30x11 = 420

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### Supper Duty:

**May:** Dulcie Brooke.  
**July:** Tony Johns

**June:** Volunteers needed

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### Committee

**President** ..... Mr. Peter Dalman  
**Vice-President** ..... Mrs. Carol Hall  
**Secretary** ..... Mr. John Gregurke  
**Treasurer** ..... Mr. Bob Curtain

Mr. Greg Binns .....  
Miss Helen Burgess .....  
Miss Maureen Christie .....  
Mrs. Claire Dalman .....

Mrs. Carol Hall (Editor) .....  
Miss Fran Hanrahan .....  
Mr. Les Hanrahan .....

**Correspondence:** PO. Box 328W, Ballarat West, 3350.

**Email:** Secretary:  
Editor:

**Website:** [www.ballarat.yourguide.com.au](http://www.ballarat.yourguide.com.au) Click on *Local Info*. Search *Environment*.

**Meetings** are held at the Ballarat Horticultural Centre, cnr. Gregory & Gillies Sts (VicRoads 254 F8) on the first Friday of the month at 7.30pm.

**Excursions:** Depart from Ballarat Market Place (formerly Creswick Plaza) Creswick Rd., Ballarat (VicRoads 255 M10) at 9.30 am unless otherwise specified.

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